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SPACE CENTER Roundup

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Expedition crew rotation highlights upcoming shuttle mission

Highlights of upcoming space shuttle mission STS-102 (International Space Station Assembly Flight 5A.1) include launch of the second resident crew to live aboard the ISS and delivery of the Leonardo Multi-Purpose Logistics Module (MPLM) to the space station. STS-102 will be the seventh space shuttle mission in support of assembly of the ISS.

The primary objective of the mission is to deliver and integrate the 5A.1 launch package into the orbiting ISS Stage 5A, including ISS crew rotation of three crewmembers. In addition to the Leonardo MPLM, the launch package consists of the Integrated Cargo Carrier (ICC), two Assembly Power Converter Units and gas can experiments in the orbiter cargo bay, and ISS equipment and supplies in the orbiter crew compartment.

The MPLM is a pressurized module that transports the U.S. Lab system racks, resupply/return stowage platforms, resupply stowage racks, and the Human Research Facility international standard payload rack to the ISS. The ICC carries the Pump Flow Control Subsystem, the Laboratory Cradle Assembly, the External Stowage Platform and the rigid umbilical, which will be installed onto the ISS during two scheduled space walks.

" ISS Flight 5A.1 will see a lot of 'firsts' for the International Space Station Program," said Bernestine Dickey, NASA 5A.1 launch package manager. "It will be the first crew rotation flight, the first flight of Multi-Purpose Logistics Module Flight Module 1 Leonardo, the first flight of a dedicated payload facility–the Human Research Facility, the first flight of the ISS long-term logistics plan to provide an on-orbit stowage capability for unpressurized spares–the External Stowage Platform, and the first flight where the Payload Operations Integration Facility at Marshall Space Flight Center becomes operational.

"Steve Prejean, the Boeing launch package manager, and I have been very fortunate to have worked with such a great and talented 5A.1 Launch Package Team consisting of hardware developers and cargo integrators from the many NASA and contractor organizations. All were instrumental in the development of this flight."

The STS-102 crew aboard *Discovery* includes Mission Commander Jim Wetherbee, making his fifth flight; Pilot James Kelly (first flight); and mission specialists Andy Thomas (fourth flight) and Paul Richards (first flight). In addition, Expedition Two Commander Yury Usachev, Expedition Two Flight Engineer James Voss and Expedition Two Flight Engineer Susan Helms will be aboard and will replace Expedition One Commander Bill Shepherd, Expedition One Soyuz Commander Yuri Gidzenko and Expedition One Flight Engineer Sergei Krikalev on the ISS, all of whom will return with the rest of the STS-102 crew.

The crew will install the MPLM onto the ISS over the course of two planned space walks during docked operations. During the space walks, the crew will prepare the MPLM for transfer, install hardware needed for ISS Assembly Flight 6A, and deliver spare parts to the space station.

Tasks planned for the first space walk, to be conducted by Voss and Helms, include removing an early communications antenna and disconnecting umbilicals from Portable Mating Adapter 3 so that it can be moved from the bottom-facing port on Unity to its left-facing port. The PMA will be moved at the end of the first space walk. The MPLM will be moved to the recently vacated bottom-facing port on Unity the next day.

During the second space walk, Richards and Thomas will throw power switches to power the MPLM from station power supplies in the Lab. After the second space walk, the shuttle's robotic arm will be used to place the MPLM back into the payload bay.

This mission will be the first shuttle docking to the ISS that will occur along the velocity vector or +VBAR. The velocity vector points in the direction of motion of the ISS as it follows its orbit. The ISS will nominally maneuver to the docking attitude approximately two hours before docking. In this attitude, the Zvezda Service Module navigational light will be visible to the orbiter through the night period for use as a back-up navigational aid to the shuttle rendezvous radar sensor. The rendezvous radar supplies relative range, velocity, and angle data to the shuttle's on-board Guidance, Navigation, and Control computers.

During their nearly five-month stay aboard the ISS, the Expedition Two crew will install and conduct tests on the Canadian-made Space Station Remote Manipulator System, unload the Italian-made logistics module, conduct internal and external maintenance tasks, and conduct medical and science experiments. The SSRMS is scheduled to be delivered to the space station in April during STS-100 (ISS Assembly Flight 6A). In June, the STS-104 (ISS Assembly Flight 7A) crew will deliver the Joint Airlock, which will be added to the space station. Helms will be the SSRMS operator, taking the Airlock from the shuttle and berthing it to the space station.

The Expedition Two crew will conduct an internal EVA during the stage between 5A.1 and 6A to move the docking cone (a special hatch that is also used for docking) that was used for the Service Module docking to the nadir port on the SM transfer compartment. This activity will support future docking of the Russian Docking Compartment, which is also the Russian EVA Airlock, currently scheduled to be launched and docked to the space station after the STS-104 mission. This internal EVA will be

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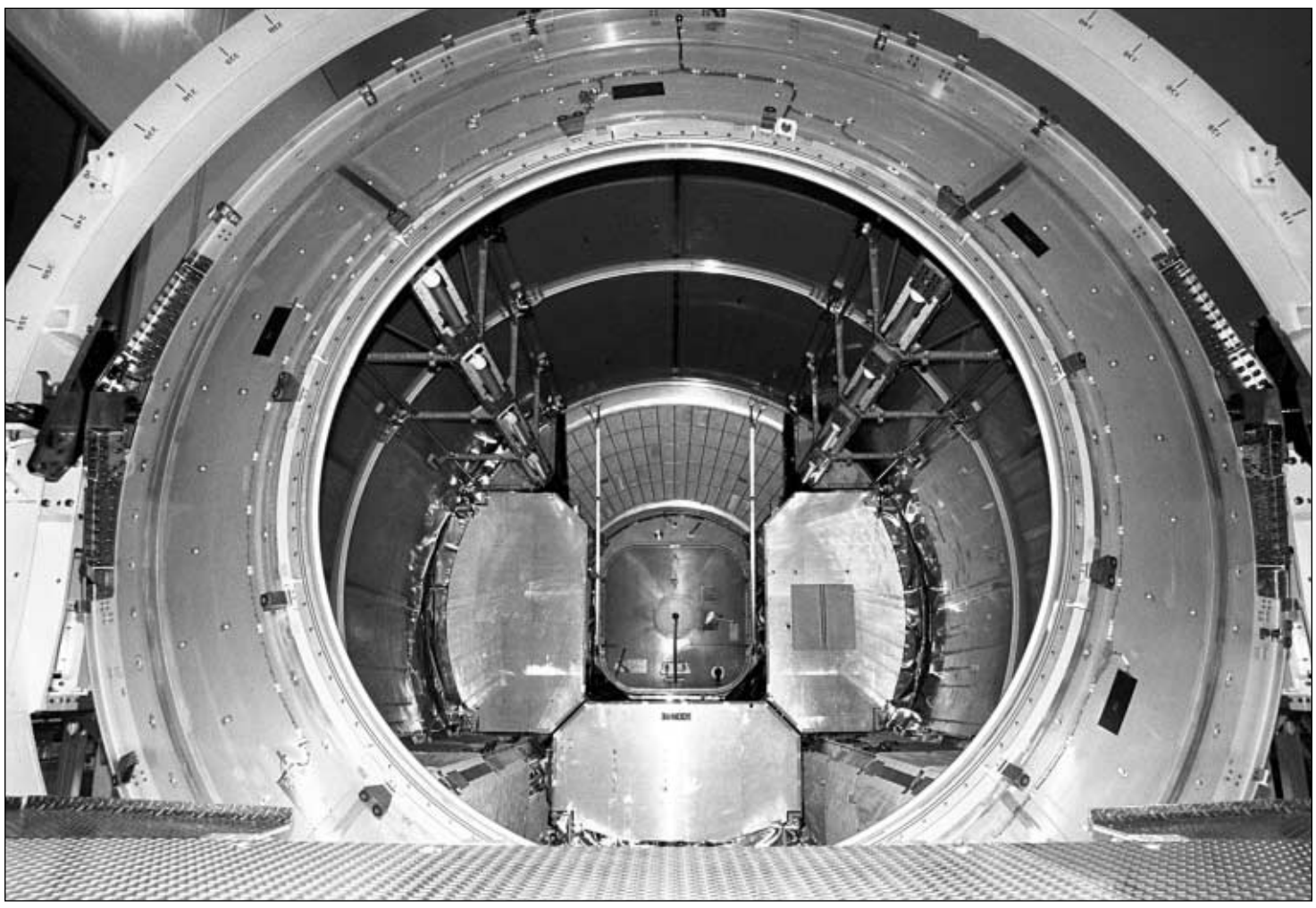

The inside of Leonardo, the first Multi-Purpose Logistics Module for the International Space Station, is seen after the end cap is removed. It is one of three from Alenia Spazio and will be operated by NASA and supported by ASI, the Italian space agency. The MPLMs will be carried in the payload bay of a shuttle orbiter and will provide storage and additional work space for up to two astronauts when docked to the ISS. Leonardo is scheduled to be launched on STS-102 in March.

High-tech rescue vehicle on the way.

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Space flight pioneer recounts storied life.

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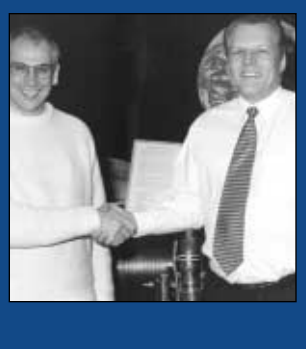

White Sands wins quality award.

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